

The structure of some complete subfields of $k((X))$

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Abstract

Let $K = k((X))$ be the field of Laurent series in one variable X , with coefficients in an arbitrary field k . Let K' be a closed subfield of K relative to the X -adic topology and let k' be the residue field of K' . In this note, we give answer to the natural question i.e. about the structure of closed subfield K' of $k((X))$. We also describe that in what conditions on K' , the extension $K' \subset k((X))$ is finite.